



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/627,034

07/24/2003

Michael L. Crabtree

O02-075A

3716

29293

7590

05/10/2005

FREUDENBERG-NOK GENERAL PARTNERSHIP  
LEGAL DEPARTMENT  
47690 EAST ANCHOR COURT  
PLYMOUTH, MI 48170-2455

EXAMINER

SY, MARIANO ONG

ART UNIT

PAPER NUMBER

3683

DATE MAILED: 05/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/627,034

Applicant(s)

MICHAEL CRABTREE

Examiner

Mariano Sy

Art Unit

3683

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. The amendment filed on March 21, 2005 has been received.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirtreiter et al. (U.S. Patent Number 3,897,941).

Re-claims 1, 4, 7, 8, and 12-14 Hirtreiter et al. disclosed, as shown in fig. 11, an air spring sleeve comprising: an elastomer body 1; a first cord 17 embedded in the elastomer body, the first cord wound with a first helix angle with respect a sleeve centerline; a second cord 17 embedded elastomer body, second cord wound with a second helix angle with respect a sleeve centerline; first helix angle and second helix angle describe a differential helix angle (see col. 8 lines 1-5); first cord is disposed inward of the second cord; the first helix angle greater than the second helix angle; and wherein the first cord has a structure similar to the structure of the second cord (see col. 8 line 8, note that either the inner or the outer cord may have a greater helix angle according to the claimed combination). Note that Hirtreiter et al. discloses different cord angles in the context of increasing the rigidity of the air spring sleeve (see col. 2, lines 54-58).

However Hirtreiter et al. was silent to disclose wherein the sleeve having a torsional strain less than approximately 0.5 degree. Note that all air spring sleeves are subjected to torsional strain and that the torsional strain of the air spring sleeve depends on several variables: the rotational relationship between a piston 22 and end plate 26, size of cords, cord's helix angle, size of air spring sleeve, operating pressures, and the length of compression and extension stroke.

It would have been obvious to one of ordinary skill in the art to have build the air spring sleeve of Hirtreiter et al. having a torsional strain less than approximately 0.5 degree, based on the variables recited above, in order to optimize the rigidity of the air spring sleeve.

Re-claims 2, 3, 5, 6, 9, and 10 Hirtreiter et al. disclose a general ranges of the helix angle of the cords. Note that the claimed ranges are within the general ranges disclosed by Hirtreiter et al. in the first ten lines of column 8. Further note that Hirtreiter et al. discloses different cord angles in the context of increasing the rigidity of the air spring (see col. 2 lines 54-58).

Accordingly, it would have been obvious to one of ordinary skill in the art to which the invention pertains at the time the invention was made to have optimized the helix angles according to the ranges of claims 2 and 3 in order to attain greater air spring rigidity, see MPEP 2144.05.II. A and B.

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirtreiter et al. in view of Crabtree (U.S. Patent Number 4,763,883).

Re-claim 11 Hirtreiter et al. fail to disclose aramid cord.

Art Unit: 3683

Crabtree disclosed the use of aramid (see col. 5, line 15) for reinforcing an air spring.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included aramid cord in Hirtreiter et al. air spring, according to the teachings of Crabtree, in order to reinforce the air spring sleeve.

5. Applicant's arguments filed on March 21, 2005 have been fully considered but they are not persuasive.

Examiner maintains the rejection is proper. Hirtreiter et al. '941 teaches the use of an air spring sleeve (see fig. 11) but was silent to disclose wherein the sleeve having a torsional strain less than approximately 0.5 degree. Note that all air spring sleeves are subjected to torsional strain and that the torsional strain of the air spring sleeve depends on different variables such as the rotational relationship between a piston and end plate, sizes of cords, cord's helix angle, size of air spring sleeve, operating pressures, and the length of compression and extension stroke.

One of ordinary skill in the art would have build the air spring sleeve of Hirtreiter et al. having a torsional strain less than approximately 0.5 degree, based on the variables recited above, in order to optimize the rigidity of the air spring sleeve.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mariano Sy whose telephone number is 571-272-7126. The examiner can normally be reached on Mon.-Fri. from 8: 30 A.M. to 2:30 P.M.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bucci, can be reached on 571-272-7099. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

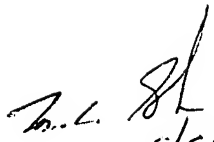
Application/Control Number: 10/627,034

Page 6

Art Unit: 3683

 M. Sy

May 4, 2005

  
5/5/2005  
MATTHEW C. GRAHAM  
PRIMARY EXAMINER  
GROUP 310